



SHELBY COUNTY HEALTH DEPARTMENT



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August 30th, 2016

Ms. Laura Ackerman, Chief Science and Ecosystem Support Division United States Environmental Protection Agency, Region 4 980 College Station Road Athens, GA 30605-2720

RE: Response to the 2016 Ambient Air Monitoring Technical Systems Audit (TSA) Report SESD Project: #16-0006

Dear Ms. Ackerman:

The Shelby County Health Department (SCHD) Air Monitoring Branch (AMB) has reviewed the findings and concerns submitted by the EPA Region 4 Science and Ecosystem Support Division (SESD) from the TSA that was conducted of our program on February 2 thru 5.

The SCHD AMB has made a diligent effort to make corrections to the concerns and has provided a plan to address the findings found in the report. The responses and comments are provided in this letter.

If you have any questions regarding this response or require more information, please contact me at (901) 222-9599.

Sincerely,

Robert Roberts, P.E.

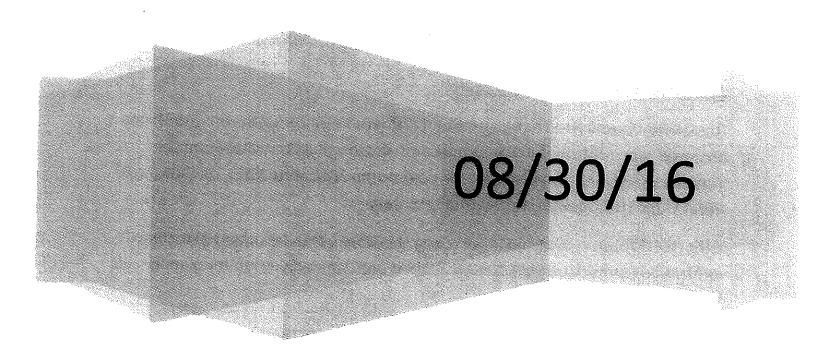
Technical Manager/Pollution Control

Robert Rogers

Shelby County Government Pollution Control Section

Response to EPA's TSA from 02/02/16 thru 02/05/16

Air Monitoring Branch



3.1 FIELD OPERATIONS

Concern 3.1.1

The SCHD are not comparing the monthly flow checks for the $PM_{2.5}$ monitoring program against the design flowrate of the sampler, as called for in EPA Method 2.12.

Discussion

The PM_{2.5} flow evaluations should include two comparisons. First, the comparison between the sampler flowrate and the audit standard should agree within 4%. Second, a comparison should be made between the volumetric sampler flowrate and the design flowrate of the sampler (16.67 l/min). This second flow comparison should agree within 5%. Quality assurance records should document each of these comparisons.

Recommendation(s)

The comparison between the sampler and the design flowrate should be calculated during every monthly flow rate check event. Towards that end, the SCHD modify its PM 2.5 evaluation forms to account for this second flow comparison. SESD recommends that the SCHD review all monthly flow check evaluation forms from the 2013-2015 time period and calculate this comparison to ensure compliance with regulatory requirements.

Corrective Action Response by SCHD

The Shelby County Health Department (SCHD) Air Monitoring Branch (AMB) has reviewed and recalculated the sampler and design value flow rates from the monthly checks performed at the $PM_{2.5}$ sites from 2013 thru 2015. All flow rates were within the appropriate acceptable criteria.

After the TSA was conducted in February, the SCHD AMB has updated the flow verification forms to include the calculations and comparisons of the sampler and design flow rate.

Appendix A: PM 2.5 Flow Verification Form

PM 2.5 WEEKLY FLOW VERIFICATION

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Concern 3.1.2

SCHD staff are not comparing the quarterly flow checks for the PM_{10} monitoring program against the design flow rate of the sampler, as called for in EPA Method 2.11 - Table 2.1.

Discussion

40 CFR Part 58, Appendix A, §3.3.2 requires a quarterly flow check of the PM₁₀ sampler against a known audit standard. EPA Method 2.11 provides more detail on this quality control activity. The method calls for two quality assurance checks for PM₁₀ samplers, similar to those discussed above for the PM_{2.5} samplers. As detailed in Method 2.11, as well as in the data validation tables found in Appendix D of the EPA *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II*, this one-point flow check should compare the sampler flow rate against the audit standard, with results showing agreement within 7%. A second comparison of the actual sampler flowrate against the design flowrate of the sampler should also be calculated; these values should agree within 10%.

Recommendation(s)

This second comparison of the actual sampler flowrate against the design flow rate of the sampler should be calculated by the SCHD and added to the PM_{10} documentation. Towards that end, the SCHD should modify its PM 10 evaluation forms to account for this second flow comparison. SESD recommends that the SCHD review all quarterly flow check evaluation forms from the 2013-2015 time period and calculate this comparison to ensure compliance.

Corrective Action Response by SCHD

The SCHD AMB will review the quarterly flow checks and ensure that the sampler flow rate and design flow rate are documented and compared.

After the TSA in February, the SCHD AMB updated the forms and the site operators now document the percent difference between the sampler to the transfer standard value and between the sampler to the design value.

PM10/LEAD HI-VOL DATASHEET

Site ID	Location
Sampler SN	Operator
Filter Number	орогио
Transfer Standard (TS)
TS Certification Date	
Setup Date	
Barometric Pressur	
Ambient Temperati	ure
Transfer Standard (TS)	
TS Certification Date	
Manometer Reading	
Start Flow Rate (cfn	n)
Transfer Standard (TS)	
TS Certification Date	
Start Date (mmddyy	1
Start Time (hh:mm)	·
Stop Date (mmddyy)	
Stop Time (hh:mm)	
Manometer Reading	
Stop Flow Rate (cfm)	
Transfer Standard (TS)	
TS Certification Date	
Barometric Pressure	
Ambient Temperature	
Transfer Standard (TS)	
TS Certification Date	
Remarks	
Flow rate (cfm)	± 7% to TS ± 10% to DV
40	
	LAB USE ONLY
Date	Operator
Initial Weight	Final Weight
Weight Difference	
PM10/Lead Concentrati	on (μg/m³)

SHELBY COUNTY HEALTH DEPARTMENT

BUREAU OF ENVIRONMENTAL HEALTH

814 JEFFERSON AVENUE MEMPHIS, TENNESSEE 38105

Concern 3.1.3

A tree at the Frayser Station monitoring location may soon become an issue with respect to siting requirements found in regulation (40 CFR Part 58, Appendix E, §5).

Discussion

During the TSA, EPA auditors visited several of the monitoring site locations including the Frayser Station (AQS #47-157-0021). The auditors noted the dripline of the tree at the site to be right at the limit of 10 meters for the dripline requirement. The 10-meter dripline requirement is a "must" in the regulation; EPA encourages a dripline distance of 20 meters, when possible. Due to the tree size and its close proximity to the monitoring station, the tree will remain a regular maintenance issue for the SCHD. The dripline requirement is in place to reduce the possibility of any scavenging effect on pollutant concentration measurements.

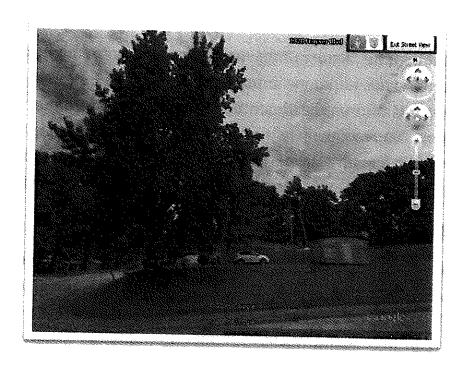
Recommendation(s)

The SCHD may wish to investigate the possibility of tree removal with the property owner. The regular maintenance to meet the 10-meter dripline distance may be the best short-term solution at present. Long term, the SCHD may want to consider relocation of the monitoring site to a more suitable location, balancing the cost of regular tree maintenance versus site relocation.

Corrective Action Response by SCHD

The SCHD AMB was aware of the tree growth at the Frayser Air Monitoring Station. In February 2015, the Shelby County Public Works Dept. was contacted to request their assistance for trimming the tree. But, they were not able to assist at the time due to their workload and not having the appropriate type of equipment. In April and May 2015, an electrical company was contacted to replace the rotting electrical pole at the air monitoring station. During this time, the tree was trimmed and pruned along and over the power line. In January 2016, Reds Tree Services was contacted for a quotation for either the removal or

pruning of the tree. Due to the age of the tree, Reds Tree Services recommended that removing the tree would be our best option rather than yearly pruning. The tree was removed on February 17, 2016. The before and after images of the tree are below.





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Observation 3.1.4

A completed logbook was found at the monitoring site; the logbook's last entry was from 2013.

Discussion

Logbooks document the history of the instrument and/or the monitoring site itself. They can provide additional proof of the quality assurance procedures conducted and add information about the routine operations of the instrumentation. Depending on its size and use, logbooks can span many years. Various agencies in Region 4 have experienced loss of these documents due to a wide variety of reasons: severe weather, vandalism, disgruntled employees, etc.

Recommendation

EPA recommends agencies retire completed logbooks with other monitoring record archives at their main offices. In addition, EPA recommends regular copies (i.e. scans) of logbooks be made and entered into the record archive. This copy would serve to protect against the loss of this information for those reasons cited above.

Corrective Action Response by SCHD

The SCHD AMB has a designated location for storing all completed logbooks at the 814 Jefferson 4th Floor office. As of 2013, the logbook pages are scanned monthly and saved to Shelby County's network. These copies are identified and saved in a folder according to year, site name, pollutant, monthly report, quality control checks, graphs, and logbook entries. An example of a file name is 'February 2016 Shelby Farms CO Monthly Report, Quality Control Check, Graphs and Logbook Entries'. Furthermore, logbook hardcopies are placed in an archived record folder categorized by year, site and parameter.

3.2 LABORATORY OPERATIONS

Concern 3.2.1

The balance in the PM_{10} laboratory is having difficulty holding a calibration.

Discussion

The PM₁₀ balance used in the weighing of the PM₁₀ monitoring filters has failed to hold its calibration over the last three certification checks. These checks are performed every six months by a laboratory contractor. The balance is old; an exact purchase date was not documented by the auditor, but in conversation with SCHD personnel, it appears the balance has been in use for quite some time. Under normal operational conditions, these instruments tend to hold their calibrations and do not routinely need adjustment. If the balance needs recalibration after only a six month timeframe, it indicates the balance may be aged and its performance faltering. With this in mind, the balance's instability may be impacting data quality.

Recommendation(s)

The SCHD should investigate the purchase of a new balance for the PM_{10} monitoring program. As a cost study, the SCHD may want to investigate the use of continuous PM_{10} instrumentation: these samplers are considered Federal Equivalent Methods (FEM) and can be used in place of the Hi-Volume samplers, which would negate the need for a PM_{10} weighing laboratory. A second option would be to use low-volume samplers (such as the 2025i series) for PM_{10} operations; the filters could then be analyzed by the same contract laboratory used to weight the $PM_{2.5}$ filters.

Corrective Action Response by SCHD

The SCHD AMB ensures the validity of all PM10 filter weight measurements by adhering to the EPA guidelines. Additionally, certified weights are used to challenge the calibration of the balance before each PM_{10} filter weighing event. For the last several certification tests, the SCHD balance has held its calibration in the typical filter weight range (3-5 g) based upon the low range of the calibration

curve (1-10 g) from the certification process. The balance has only been adjusted due to an exceedance in the high range (>100 \pm 0.0005 g). The assumptive statement that "these instruments tend to hold their calibrations and do not routinely need adjustment" is not accurate, and does not apply in this case based upon our past certificate. Furthermore, the certifying company, Rite Weight, states that analytical balances, new or aged, are often adjusted during the certification process. A field technician from Rite Weight was at the SCHD on July 28 performing the biannual certification. He was asked about the age and accuracy of the balance in use. The lab manager was also contacted and his recommendation was that the balance has "expired" as far as its capabilities of holding the calibration at the high end, but since we don't consistently weigh above 4 to 5 grams, he didn't think it was an issue. The SCHD AMB will continue to evaluate the calibrations of the balance and will purchase another one, if necessary. Also, since the SCHD has requested to discontinue the filter based PM₁₀ samplers at the Gas Service Center, we may no longer need a balance to weigh the PM₁₀ filters.

3.3 DATA MANAGEMENT

Concern 3.3.1

A review of the precision and audit data revealed the SCHD are zero-correcting these values, but not applying this same correction to the ambient data.

Discussion

The current version of EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II (May 2013) allows for zero adjustments (§12, Page 9). If an agency elects to zero-adjust, the data collected forward of that adjustment must also be zero corrected.

<u>Recommendation</u>

SESD recommends the SCHD stop zero-correcting the precision values. The option does remain for the SCHD to continue zero-correcting, but the ambient data must also be adjusted moving forward. With respect to the 2013-2015

datasets, the SCHD can remove the zero-correcting from the precision and audit data, or it may zero correct the raw data set. EPA does recognize the burden of this effort and recommends the SCHD focus efforts on those checks failing the zero-drift guidance in the SCHD QAPP.

Corrective Action Response by SCHD

The SCHD AMB has reviewed the precision and audit data for 2013-2015. All quality control checks with zero-correction will be deleted and replaced with values that did not undergo zero-correction. Then, the data will be resubmitted into the Air Quality System for certification. After the TSA in February 2016, the SCHD AMB no longer corrects for zero drifts when performing quality control checks. All associated quality control check forms have been updated.

3.4 QUALITY ASSURANCE

Finding 3.4.1

The SCHD's Quality Assurance Project Plan (QAPP) is expired and should be updated.

Discussion

The air monitoring program QAPP should be reviewed each year for necessary updates. These updates would include changes in monitoring equipment, network design, EPA regulations and guidance, etc. The QAPP should be submitted to EPA for review and approval at least every five years.

<u>Recommendation(s)</u>

The SCHD should make every effort to update and maintain its quality system documentation, incorporating the latest regulations and guidance from EPA. EPA Region 4 is requesting a schedule for completion of the QAPP.

Corrective Action Response by SCHD

The SCHD AMB is working on an updated QAPP for the program. We will provide an update or have a completed copy submitted by the end of this year.

Concern 3.4.2

Current staffing levels may not allow for the additional quality assurance duties required of an independent PQAO.

Discussion

Until recently, the SCHD has operated within the PQAO of the State of Tennessee. As such, the State of Tennessee took responsibility for conducting the annual performance evaluations (i.e., quality assurance audits) required under 40 CFR Part 58, Appendix A. With SCHD establishing itself as an independent PQAO, the SCHD assumes responsibility for completing the annual performance evaluations. EPA encourages agencies with independent quality assurance personnel to conduct internal systems audits, in addition to the performance evaluations. Internal systems audits would give insight into the agency's performance in the years between federal TSAs. In addition to these auditing duties, a quality assurance position could coordinate and maintain the quality system documentation required for the air monitoring program.

EPA regulations and guidance recommend independent staff and require independent equipment for conducting the annual performance evaluations cited above (40 CFR Part 58, Appendix A, §3.2.2.3, §3.2.4).

Recommendation(s)

The SCHD should consider establishing an employee position for the quality assurance responsibilities of the air monitoring program

Corrective Action Response by SCHD

In light of falling revenues, getting approval for additional staffing is doubtful at this time. We will continue to assure staff members are cross-trained on multiple monitors for back-up as well as for QA needs. We are continually looking for ways

to improve efficiency to free up staff time in order to focus better on maintaining monitoring accuracy. If necessary to meet all auditing requirements, we will consider using an independent contractor.

Observation 3.4.3

New cylinder standards are not tested prior to use by the SCHD.

Discussion

The purchase of new cylinder standards for quality control and quality assurance activities is a regular part of ambient monitoring. Manufacturers do take effort to ensure the quality of their products; however, errors can occur in the manufacturing or shipping process that can impact gas purity and blend accuracy. Errors can occur during the initial setup of the cylinder standards by the monitoring agency, which can impact both the cylinder gas and subsequent data quality.

Recommendation(s):

To minimize potential impact to data quality, EPA recommends performance testing all new gas cylinders to ensure accuracy of cylinder content prior to field deployment.

Corrective Action Response by SCHD

The SCHD AMB only uses vendors that are participants of the EPA Certified Protocol Gas Program. The SCHD AMB conducts performance tests on all new cylinders before official deployment. The new cylinders are connected to the site calibrator, and a quality control check is performed on the corresponding analyzer. The results are compared to the previous QC check with the older cylinder equipped. If the results are similar, a conclusion can be determined that the new gas cylinder is accurate.